

Jamie L. Whitten Plant Materials Center

Coffeeville, MS



Commercial Seed Growers' Production Guide

September, 2008

Homer L. Wilkes
State Conservationist
Jackson, Mississippi

DISCLAIMER

Information provided in this publication constitutes no endorsement or guarantee by the USDA or NRCS of any plant material, supply, equipment or cost listed. While an effort has been made to provide an accurate listing of cost of production, environmental factors may alter individual costs in specific years and locations. The information is a general guide to cost of production of these releases.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

Table of Contents

Section 1:	Introduction.....	p. 4
Section 2:	Fact Sheets for MSPMC Plant Releases.....	p. 7
Section 3:	Production Practice Guidelines.....	p. 28
Section 4:	Combine Settings for Seed Harvest at Jamie L. Whitten PMC (John Deere Model 9410).....	p.35
Section 5:	Estimated Seed Production Cost Budgets for Jamie L. Whitten PMC Releases.....	p. 37

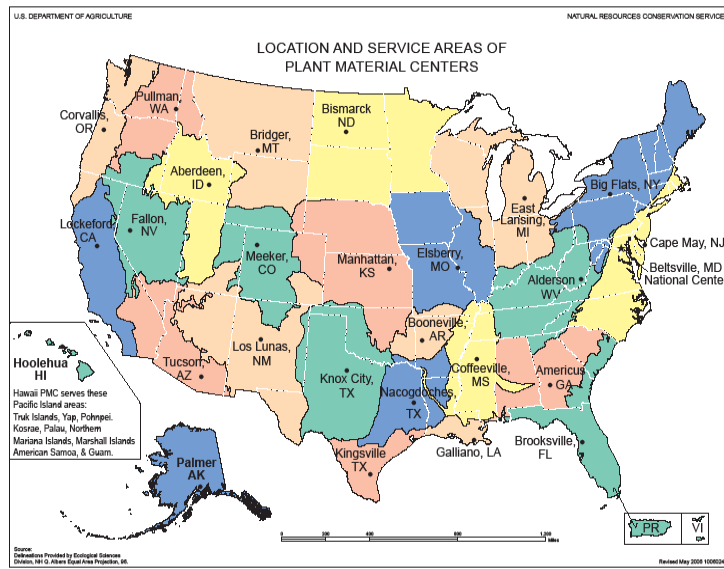
Section 1: Introduction



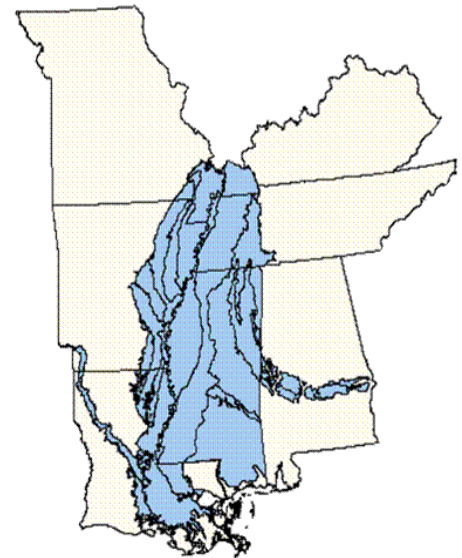
Introduction

The Jamie L. Whitten Plant Materials Center (PMC), located near Coffeeville, Mississippi, is operated by the USDA Natural Resources Conservation Service (NRCS). This PMC is one of a national network of plant centers dedicated to providing vegetative solutions for conservation problems.

Working with a broad range of plant species, including grasses, forbs, trees, and shrubs, our mission is to address priority needs of NRCS field offices and land managers in both public and private sectors. Our service area includes Mississippi, the delta areas of Arkansas, the Blackland prairie of Alabama, and parts of Louisiana, Tennessee, Missouri, and Kentucky



NRCS Plant Material Centers Nationwide



MSPMC Service Area

The purpose of this publication along with MSPMC tours and workshops is to bridge a gap between our mission and the commercial seed industry in an effort to educate and create a greater need in the use of conservation plants for the following natural resource concerns:

- ***Reducing soil erosion on cropland***
- ***Improving and protecting the quality of surface and groundwater***
- ***Improving productivity of pasture and grazing lands***
- ***Protecting, creating and restoring wetlands, riparian areas, buffers and streambanks***
- ***Providing protective cover and restoring disturbed areas***
- ***Improving wildlife and wetland habitats***
- ***Promoting use of native plants and pollinator conservation in agricultural landscapes***
- ***Production of biofuel plant materials***
- ***Production and distribution of native wildflowers***

Selection Process

When conservation problems are identified, the center searches for the best plant or plants to solve the problem. The process of developing and testing promising plant materials involves the following consecutive stages:

Assembly of Plants

Individual plants are collected from native stands of the desired species within the region. An accession number is assigned to identify the plant during evaluation, increase and storage.

Initial Evaluation

Individual plant performance is observed in a nursery setting. Plant Performance is evaluated recording positive and negative characteristics of the plant.

Seed Increase

The most promising plants are selected and production of seed or plants is initiated on the center. The goal is to develop a production protocol in order to generate materials for advanced evaluation.



Advanced Evaluation and Field Plantings

Cultural and management techniques are tested to determine establishment and production characteristics and guidelines. Final evaluations of selected plants are conducted in the field under diverse environmental conditions.

Release of Plant Material

Along with cooperating agencies, NRCS will name the new release, describe its conservation benefits and make it available to growers.

MSPMC Active Releases

- **‘Highlander’ eastern gamagrass**
- **‘Quail Haven’ reseeding soybean**
- **‘Halifax’ maidencane**
- **‘Meechee’ arrowleaf clover**
- **‘Chiwapa’ Japanese millet**
- **Hopefield Selection trailing wildbean**
- **Lark Selection partridge pea**
- **Leflore Source creeping burhead**
- **Indian Bayou Source powdery thalia**
- **Leaf River Source woolgrass**
- **Morton Germplasm shrub willow**

Product highlights include:

- **Plant Guides, Fact Sheets, Technical Notes, & Newsletters**
- **Cultural specifications for plant materials used in USDA Farm Bill Programs**
- **Provide plant information for NRCS Conservation Practice Standards**
- **Production protocols for seed and plant industry**
- **Seed and Plant Vendors Guides**
- **Plant Technology Update**



Section 2:

Fact Sheets for

MSPMC Plant Releases



Hopefield Selection Trailing Wildbean

Strophostyles helvula (L.) Ell.



Description

Hopefield Selection Trailing Wildbean is a native, warm season, annual legume with twining or trailing stems. The plants bloom from summer to fall and flowers are purplish in color. Seed pods are 4-9 cm. long and seeds are persistently woolly due to fragments of the inner pod adhering to the seed. The pods will shatter, dispersing the seeds when they are ripe.

Uses: Quail and turkeys are among the birds that feed on the seeds of trailing and it is used in reseeding mixtures to prevent erosion.

Site Adaptation: It is adapted to medium to fine textured soils, but is found growing on infertile, sandy and droughty soils. Trailing Wildbean occurs in open woodlands, abandoned cropland, and coastal dunes.

Establishment

Planting Time: Late March – early June

Seedbed Preparation: Seeds should be planted on a firm, clean seedbed in the same manner as any garden bean.

Planting Rate and Method: For seed production, inoculate seed with *Strophostyles* Special 1 inoculum and seed at 15 lb/acre. Row widths from 40-20 inches are favorable.

Fertilizer Requirement: Fertilize production fields at a rate of 300 lb/acre of 8-24-24. For wildlife and critical area mixtures, plant seed at 10 lb/acre.

Management

Seed Production: Natural reseeding from previous year's seed crop, combined with hard seed will probably be adequate for sufficient stands in succeeding years. A light disking or other means of soil disturbance to expose mineral soil and to eliminate weed competition will enhance reseeding. Seed can be direct harvested with a conventional combine. Because Hopefield Selection is an indeterminate seeder, seed yields vary but yields of 80 lb/acre have been harvested at the PMC. To facilitate harvest, defoliate the plant one week prior to harvesting with Gramoxone® at 2.5 pints/acre.

Lark Selection Partridge Pea

Chamaecrista fasciculata (Michx.) Greene



Description

Lark Selection Partridge Pea is a native, warm-season, annual legume with numerous yellow flowers produced from July to September. Plants average 2 feet tall, but may exceed 4 feet on better soil. The black, shiny, flattened seeds are produced in pods that pop open to scatter the seed when mature.

Uses: A choice food of upland game birds and song birds.

Site Adaptation: Grows naturally on practically all soils in Mississippi. It grows best in full sun, but will tolerate light shade.

Establishment

Planting Time: April 15 – June 15

Seedbed Preparation: Prepare a clean, firm seedbed. No till applications work well with Lark Selection if shallow seeding depths can be achieved. Partridge Pea will grow on poor soils but responds well to fertilizer.

Planting Rate: Broadcast or shallowly drill 6-8 lb/acre scarified seed ¼ inch deep. To ensure nodulation seed should be inoculated with EL (cowpea) before planting. Seedling disease is often observed, but the above rates compensate for such loss.

Fertilizer Requirement: Apply 300 lb/acre of 0-20-20 or similar analysis at planting.

Weed Control: Early cultivation when planted in wide rows will give Lark Selection an edge over competing weeds. Herbicides can give Partridge Pea an advantage as well, but few are labeled.

Harvesting: Harvest timing is critical to insure good yields in seed production. Losses from pods shattering can be minimized with the use of a draper head.

Companion Plants: Partridge Pea is compatible with many grass species. It can be too tall and competitive for planting with some wildflower species, especially when ample fertility is available. On less fertile sites, such as roadbanks, its growth rate may be reduced enough to allow planting with wildflowers such as Black-Eyed Susan, Purple Coneflower, Butterfly Milkweed, and Gayfeather.

Management

Disking/burning of natural or planted stands of Partridge Pea usually reseed and do well for one to three years but will gradually decline without maintenance. Partridge Pea responds well to controlled fire. Areas should be burned in February for best results. Disking will also keep stands in good condition and is probably a better method in areas where heavy stands of Broomsedge occur. Disking should be done in late February to early March. Plants can be mowed in the spring before they are tall enough to be cut by the mower. The plants should not be mowed again until after seed matures in early to mid-October.

‘Quail Haven’ Reseeding Soybean

Glycine soja Sieb. & Zucc.



Description

‘Quail Haven’ Reseeding Soybean is a vining, annual legume native to China. Short, rust-colored hairs cover the leaves, stems, and pods. The small clusters of lilac to purple flowers are borne at the base of the trifoliate leaves. Flowering occurs from July to early August. The seeds are smaller than commercial soybeans, and vary in color from olive to black to mottled with both colors.

Uses: Used for wildlife food and cover, soil improvement, and hay. Seed are particularly attractive to quail.

Site Adaptation: Adapted to moderately well-drained soils of average or better fertility. Not adapted to deep sands or wet soils. Plantings made in areas with heavy deer populations are generally not successful because of severe grazing pressure.

Establishment

Planting Time: April 1 to June 15.

Seedbed Preparation: Prepare a good seedbed by disking and harrowing two or three weeks prior to planting. Can be no-tilled in the same manner as conventional type soybeans.

Planting Rate and Method: Plant 6-8 pounds per acre in 36 to 42 inch rows using a corn planter; 20-25 lb/acre (21-26 oz/100 square feet) broadcast or drilled. Seed should be treated with type S (soybean) inoculant before planting. Cover seed about one inch deep. Plantings may need to be protected from deer and livestock grazing. Seed matures in late October or November. Harvest should be done as soon as possible after the leaves are killed by frost. Sufficient seed will shatter during harvest to assure successful reseedling.

Fertilizer Requirement: A soil test should be taken and the recommendations for commercial soybeans followed. If a test is not available, apply 300-400 lb/acre (11-15 oz/100 square feet) of 0-14-14 or similar fertilizer at planting. Apply 200-400 lb/acre (7-15 oz/100 square feet) annually, or as needed to maintain satisfactory production.

Establishment Continued

Companion Plants: In wildlife plantings, 'Quail Haven' will twine up weeds or other upright plants for support. Corn or Milo can be used as a companion plant in seed production fields and/or wildlife plots. Seed yields are greatest when 'Quail Haven' is planted alone.

Management

Weed Control: Herbicides labeled for conventional soybeans will work with 'Quail Haven'. Wide rows allow for cultivation practices in the early stages of growth.

Pest: 'Quail Haven' has many of the same pest one would experience in conventional type soybeans. In no-till situations, early scouting is a must to off set cutworm infestation.

Disking: It is not always necessary to disk the stand to ensure reseeding. Often ample seed will be naturally available at the appropriate soil depth for seedling emergence. In cases where the seed supply has been severely depleted by wildlife utilization or harvesting, a light disking in early spring will help secure a stand.

Seed Production: Total seed production for 'Quail Haven' is about 1400 lb/acre, but shattering often limits yields. To insure the highest yields, harvest timing is a must. Flex and/or draper heads can reduce losses. Combine settings are similar to those used for smaller seeded varieties of conventional soybeans.

'Meechee' Arrowleaf Clover

Trifolium vesiculosum Savi



Description

'Meechee' Arrowleaf Clover is an upright, cool-season, annual legume that can grow to a height of 40-50 inches under good conditions. Seeds germinate in the fall and plants grow slowly during the winter. Leaflets are large, rounded at the base, pointed at the tip, and they generally have white, v-shaped markings. Individual flowers are arranged in a cluster or head up to 2 inches long. Initially, the flowers are white to pinkish, turning brown when mature. Flowering and seed production occurs over a long period of time in late spring and summer.

Uses: Used for hay production, grazing, cover cropping, seed production, and wildlife food. Deer and turkey readily feed on this clover which often persists well into early summer. 'Meechee' is a good re-seeder and the seed can remain viable in the soil for several years.

Site Adaptation: It is suited to a wide range of soil conditions from well to moderately well-drained and from slightly acid to slightly alkaline. Optimum soil pH is 6.0-6.5. It is not suited to light textured, droughty soils of low fertility or to poorly drained, wet soils.

Establishment

Planting Time: September 1 - November 15.

Seedbed Preparation: Prepare a smooth, clean seedbed. Firm the soil with a cultipacker before planting. 'Meechee' may also be planted into an established perennial grass sod by light disking or with a no-till drill. Interseeding into a grass sod should be delayed until about the first frost date.

Planting Rate and Method: Drill 10 lb of seed per acre (10.5 gram/100 square feet). Seed should be scarified before planting and inoculated with O (Arrowleaf Clover) inoculant. Seeding depth should be one-fourth to one-half inch. Cultipacking after planting is recommended.

Fertilizer Requirement: Follow soil test recommendations if available. If not, apply 300 lb/acre (11 oz/100 square feet) of 0-20-20 or similar analysis at planting and annually in August or September as a maintenance fertilizer.

Companion Plants: Warm-season perennial grasses and small grains or annual ryegrass.

Management

Disking: To encourage reseeding, a light disking every 2-3 years in early September is recommended.

Weed Control: Meechee competes very well. Suitable stands can shade most warm season annuals. Check for what herbicides may or may not be labeled for clover production in your area.

Pest: Armyworms after early emergence can reduce stands to the point of having to replant. Scout early and often.

Grazing/Mowing: Start grazing when plants are 5-6 inches tall. Maintain a minimum top growth of 3-4 inches during the growing season. For hay, cut in the early bloom stage. When 'Meechee' is grown with perennial grasses, graze or cut the grass to a height of 2 inches by October 1. For commercial seed production, exclude livestock and do not cut for hay after May 1. For reseeding, allow plants to attain a minimum height of 12-15 inches in early July in order for seed to mature.

Seed Production: Seed can be harvested by direct combining. Seed yields range from 250 to 350 lb/acre. Dock, Mustard, and Geranium are weeds found to produce seed in the time frame in which 'Meechee' is grown. All three produce seed that is hard to remove. A roll mill can help in separation of unwanted seeds.

‘Chiwapa’ Japanese Millet

Echinochloa frumentacea Link



Description

An introduced, annual, warm season reseeding grass that is a close relative of Barnyard Grass, but produces much heavier seed yields, with about 145,000 seed per pound. It is a leafy, bunch grass that stands erect and can grow 1-8 feet in height.

Uses: Forage and wildlife habitat improvement. Seed is one of the choice foods of gadwall, mallard, wood duck, teal, and widgeon and is also utilized by several non-game birds. It also has value for fishery habitat.

Site Adaptation: Grows on wet sites and upland, well-drained soils that receive high rainfall. Yields on these soils will depend on the water supply.

Establishment

Planting Time: Late April – June 15.

Seedbed Preparation: Production fields should have a prepared seedbed or be smooth enough to allow for no-till. Wildlife plantings can be planned by drawing down water level in seedbed to expose mud flats or prepare a clean, firm seedbed by disking and harrowing.

Planting Rate and Method: Broadcast seed on exposed mud flats or disk dry land and then broadcast seed 25 lbs/acre or 15 lbs/acre drilled. Seeds should not be covered by water while germinating, but after growth starts, the plants will tolerate flooding $\frac{1}{4}$ - $\frac{1}{2}$ their height.

Fertilizer Requirement: Moderate. Apply 13-13-13, or similar fertilizer, at rates of 100 to 200 lbs/acre. Do not fertilize when seed is broadcast on exposed mud.

Management

Wildlife Management for Ducks: After germination, keep the site wet. Flood in the fall, usually 2 weeks before date of open season, and leave flooded until ducks migrate north in the spring. Depth of flooding is 2 to 15 inches.

Management Continued

Weed Control: Burndown herbicides can aid in keeping fields or plots clean up until emergence. Broadleaf weeds can be controlled with labeled herbicides. Shallow flooding can aid in reducing weed germination once Chiwapa is established.

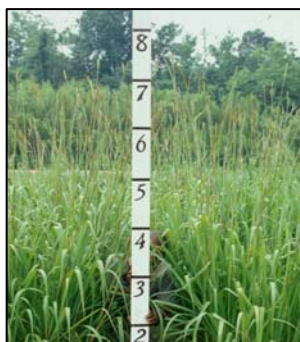
Pest: Several pest much be watched for when growing Chiwapa. Cutworms, chinch bugs, and armyworms can all reduce stands or yields. Weekly scouting will help off set major problems before they occur.

Harvest: Chiwapa maturity is 115-125 days on average. Conventional combining is suitable for seed harvesting. Lodged plants can diminish yields because of excess bio-mass that must go through the machine.

Grazing: Practice rotation grazing and maintain a stubble height of 8-10 inches. Avoid grazing when the soil is excessively wet.

‘Highlander’ Eastern Gamagrass

Tripsacum dactyloides (L.)L.



Description

‘Highlander’ Eastern Gamagrass is a native, perennial grass that forms large clumps, with thick, knotty, rhizomes. Mature foliage height ranges from 1.5 to 5 feet tall and the foliage is bluish-green in color. Flower stalks are from 5-9 feet tall and may lodge when seeds mature. Inflorescence spikes are 6 to 10 inches long, with separate male flowers held above the female flowers. The seed grains are contained in a tough fruitcase.

Uses: It is recommended for forage production and is best used as a hay crop; however, it can be grazed if given appropriate management (i.e. rotational grazing) to prevent damage to the plant stand. It also has potential as a perennial silage crop and as a source of biomass for bioenergy production. ‘Highlander’ can be used in many types of conservation plantings, such as buffers and vegetative barriers.

Site Adaptation: Grows best on well-drained, fertile soils; however, it will tolerate heavier, more poorly-drained soils. It has fairly good flood and drought tolerance. It tolerates a wide range of soil pHs, from fairly acidic to moderately alkaline.

Establishment

Seed Stratification & Planting Time: For spring planting, seeds should be given a 6 to 10 week cold, moist treatment (stratification) before planting. To stratify seeds, soak them in water for 24 hours, drain, and store them in a refrigerator or cooler set at 35 to 45° F.

For fall planting, unstratified seed should be planted. In this situation, germination will be determined by ground temperatures and moisture.

Seedbed Preparation: It is apparent that stale seedbed (fall cultivation, spring burn down) practices are beneficial in insuring success. Pasture land is "hard" for the most part and with seeding depth and soil moisture being critical factors in establishment, fall seedbed preparation seems to be the best fit. Pure no-till can be done, but it is risky in that dry conditions cannot be forecast and the seed being stratified locks the planter into a certain planting window that is short. Planting no-till may be more risky after mid-May because of normally dryer weather (i.e., hard ground)

Establishment Continued

Fertilizer Requirement: ‘Highlander’ responds to N fertilization. The first application of N should be at a rate of 40-60 pounds per acre in the spring when re-growth reaches 10 inches. Subsequent applications of 40-60 pounds per acre should be made after each harvest for hay, silage, or grazing, except for the final harvest of the season. 40-60 lbs of N three to four weeks after seed harvest is recommended for fall recovery. Both P and K should be maintained at medium to high levels according to soil test recommendations and be applied in the fall when possible.

Weed Control: ‘Highlander’ competes well once it is established. Herbicides can help in the early stages of establishment, but few are labeled.

Pest: Corn borers can reduce seed yields. No control is known at this time.

Harvesting: Seed harvest is achieved with conventional combining. Harvest timing is critical in achieving quality seed and decent yields. Delaying harvest time until the ripening of the secondary tillers is important to insure the highest yields possible.

Management

A 45-day clipping frequency typically represents two to three harvests per growing season in the lower southern states, but is greatly influenced by moisture and length of growing season. ‘Highlander’ clipped at 45 days produced an average dry matter yield of 12,400 lb/ac over three years with no significant variation between years. Clipping on a 30-day frequency reduced stands allowing weeds to invade. A 45-day clipping frequency is recommended for ‘Highlander’ for sustainable yields.

Indian Bayou Source Powdery Thalia

Thalia dealbata Fraser ex Roscoe



Description

Indian Bayou Source is a rhizomatous, herbaceous perennial with a bluish coating on leaves, flower stalks, and flowers. The attractive purple to bluish flower clusters are produced at the top of a stalk extending 2-3 feet above the foliage. The seeds are round to oval and dark brown speckled with tan when mature. Flowers are produced from late May to September with fruit maturing throughout the summer.

Uses: It is recommended for use in backyard ponds as an aquatic ornamental, constructed wetlands and home septic systems. It may have some benefit as a waterfowl food because ducks will eat the seed.

Site Adaptation: Little is known about the soil tolerance, but it is usually found growing in wet ditches and along the margins of ponds on sites where the soil often contains a high level of organic matter. The nutrient loading capacity for sewage effluent has not been determined; however, Powdery Thalia will tolerate those levels normally found in a single residence septic system. It can tolerate water depths up to 1.5 feet during the growing season with deeper flooding tolerated during the dormant season.

Establishment

Planting Time: Planting can be done throughout the year in the southeastern states.

Planting Rate and Method: Plant pieces from indoor seedlings Plant pieces should consist of a 4-6 inch section of rhizome with several growing points. If the plants are actively growing, the shoots should not be cut shorter than 6-8 inches.

A two foot spacing will allow the plants to easily fill in the planting area in one growing season. The planting hole should allow for the length of the rhizome and should be deep enough for one inch of soil to cover the top of the rhizome.

Water levels should be kept at about 1-2 inches until the plants become established and should never be allowed to cover the entire shoot of non-dormant plants. In a constructed wetland, sewage effluent should not be introduced into the water until the plants become established.

Establishment Continued

Fertilizer Requirement: A light rate of complete fertilizer will improve growth throughout the growing season, but care should be taken to prevent fertilizer movement into the ground water. In a constructed wetland, the levels of nutrients applied in the sewage may be sufficient to maintain acceptable growth.

Management

During the dormant season, old flower stalks and dead foliage can be removed, but it is a good idea to leave a long enough section of the leaf petiole so the cut end remains above the water level.

Seed Production: Seed collection should be delayed until the majority of the fruit in the cluster has turned brown, because immature fruit will fall from the cluster along with ripe ones when the cluster is shaken to remove the fruit. It is not necessary to remove the fruit coverings before sowing, but this is easily done by rubbing. The seed can be stored dry, but should be placed in a moist medium and stored in the refrigerator for three months before sowing. The growing medium must be kept moist, but not saturated and air temperatures should be at least 75° F. The seedlings can be planted in the wetland when about one foot tall. Seeds are about 1275 per lb.

‘Halifax’ Maidencane

Panicum hemitomon Schult.



Description

A native, warm season, perennial/semi-aquatic grass that grows 2-3 feet tall. It produces many sterile shoots with overlapping sheaths. Leaf blades range from ½ to ¾ inch wide and from 6-12 inches long. Branches are erect and produce a spike-type seed head. None of the seed produced by ‘Halifax’ has been found to be viable. It spreads from numerous, creeping rhizomes which allows it to form a dense vegetative mat.

Uses: Recommended for shoreline erosion control on small lakes, ponds, irrigation reservoirs, channels and stream banks. It is also planted in constructed wetlands for waste water treatment because of its ability to remove inorganic nitrogen.

Site Adaptation: It grows on mineral clays to floating organic soils. Site preferences include stream banks, shallow depressions and marshes.

Establishment

Planting Time: 1 March- 30 April

Planting Rate and Method: Rhizomes are planted into soft mud or in shallow furrows no more than two inches deep. Recommended spacing is one foot apart or less. If planted in furrows, cover the rhizome with soil.

To ensure coverage and protection of newly constructed water impoundment levees, plant two to three rows of ‘Halifax’ with one foot spacing between rows. The first row should be planted one foot above the normal water surface.

Fertilizer Requirement: At establishment, broadcast five pounds of 13-13-13 fertilizer or its equivalent per 100 feet of planted row. No fertilizer is needed if planted on catfish pond levees or in constructed wetlands because nutrients in the water will generally supply adequate fertility for plant growth.

Leflore Source Creeping Burhead

Echinodorus cordifolius (L.) Griseb



Description

Leflore Source is a creeping annual or short-lived perennial. The leaves are broadly heart-shaped, 2-7 inches long and almost as wide. The flowering shoot can reach 3 feet or more in length and are upright when they are young, often drooping and rooting at the tips to produce new plantlets. Flowering of numerous whorls of white petals and green centers begins in June and continues until frost. The fruiting heads are round clusters of small brown seeds.

Uses: It is an ornamental aquatic plant that is recommended for use in shallow ponds and pools. It may also be suitable for use in constructed wetlands. Wildlife benefits have not been documented; however, it can provide some cover for smaller species.

Site Adaptation: It is usually found growing in swamps, wet woodlands, marshes, and ditches. There are some indications that it prefers a slightly shaded location. Best growth is generally on wetland soils with fairly high organic matter.

Establishment

Leflore Source is established using transplants. The creeping nature of this plant produces numerous small plantlets that can be dug and divided from the parent plant. Larger plants can also be dug and should be planted without further division.

Cutting the leaves before planting is usually not necessary unless they are unusually tall, however, cutting any attached flower shoot is recommended.

The plants can be planted year around, but spring and fall planting will be less stressful. Recommended plant spacing is 2-3 feet. After planting, water levels should be kept at about 1-2 inches until the plants become established.

A light application of complete fertilizer may be applied to aid establishment. Sewage effluent should not be allowed onto the area until the plants are fully established.

Management

Established plants will tolerate water depths up to one foot during the growing season, with greater depths acceptable when the plants are dormant. If the growing site is infertile, the plants will respond to two or three light applications of complete fertilizer during the growing season. Burning or mowing is not recommended. No pest or disease problems have been noted, however, some late summer leaf dieback has been noted. It is not known if this dieback is due to exposure to full sunlight or to poor water quality in the growing ponds.

Morton Germplasm Shrub Willow

Salix koriyanagi Kimura ex Goerz



Description

Morton Germplasm is a large, non-native, multi-branched shrub that can reach feet up to 13 ft at maturity. It is shorter than the native Black Willow, commonly found along streams in the southeast. Young branches are slender, shiny, very flexible, pale green in color and yellowish under the bark. Leaves are either opposite or alternate, 2-4 inches long, and slightly toothed along the edges. They will be shades of pale pink and brown when emerging. Flowers are produced from February-March.

Uses: Basketry, bioengineering applications to control erosion along large stream banks. This shrub can be used with hard structures, such as rip-rap or on less erosive sites. It also has a merit as an ornamental and can be planted alone or in combination with other plants. Its wildlife benefits have not been thoroughly documented, but it can serve as nesting sites for birds and as cover for other species.

Site Adaptation: It can be grown on moist soils, with the possible exception of extremely coarse-textured ones, and it prefers at least medium fertility levels. Pre-plant grading will be required if the site is located on a severely eroded stream bank.

Establishment

Use 1-year-old cuttings (rooted/unrooted) or bundles of dormant wattles/whips. Survival will generally be higher if rooted cuttings are used, but unrooted cuttings are easier to plant.

Cuttings should be taken in late winter to early spring, before the leaves emerge. The should be made from fresh growth and measure 3/8 to 1/2 inches in diameter at the basal end and 12-15 inches in length.

Unrooted cuttings should be planted vertically in the same orientation as they were cut from the parent plant. Plant cuttings deeply enough so that only 1-2 inches of the stem is protruding above the ground. A dibble or rod can be used to make the planting hold, but the soil must be firmly tamped around the stem to ensure that no air pockets remain.

Rooted cuttings are planted in a similar manner. The planting hole must be large enough to accommodate the roots when fully spread and should be deep enough to plant the cuttings at the same depth as they were planted when rooted.

Establishment Continued

All cuttings should be planted 3-4 inches apart in similarly spaced rows, starting just above the edge of the water or rip-rap and extending to the top of the bank.

Staggering the cuttings to form a diamond pattern is recommended. Mulch, erosion control mats, or critical area seed mixtures may be required on highly erosive sites to stabilize the soil until the willows become established.

Live wattles, also known as whips, are cigar-shaped bundles of cut stems, 6 to 10 feet long, arranged so that approximately half the butt ends of the stems are on each end of the bundle. The bundle should be approximately 8 -10 inches in diameter and should be tied securely with baling twine. Wattles are planted horizontally in shallow trenches, spaced 3-6 feet apart, dug parallel to the slope beginning at the base. The ends of adjacent bundles should overlap to maintain a constant diameter along the trench. Stakes in front of the trench and placed through the bundles hold the wattles in place. They are then covered with soil that is firmly tamped down. Mulch or erosion control mats can be used in the area between the wattles if needed.

Management

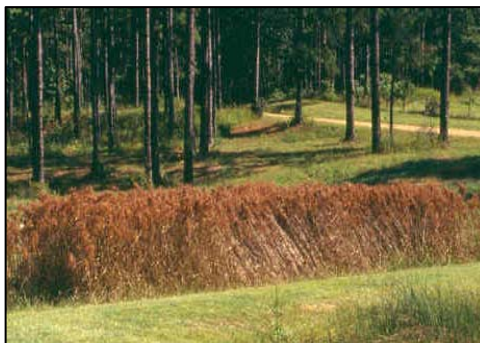
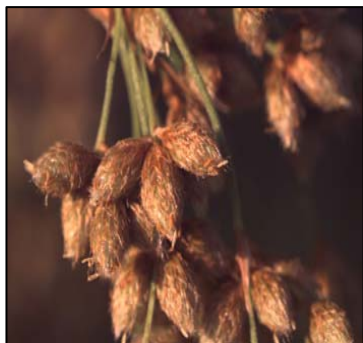
Fencing may be required on young plantings to prevent animal trampling or grazing. Stream bank conditions should be monitored regularly and needed repairs made to prevent damage to the plants and limit accelerated erosion. Replanting may be required if plant losses should occur.

Established plantings require minimal care. Plants will not tolerate frequent mowing, but mowing at 3 to 4 year intervals will not adversely affect the plant's natural growth habit.

Fertilizer applications are not generally recommended unless an erosion control seed mixture is planted in combination with the willows. Follow recommended application rates and timing for the seed mixture planted.

Leaf River Source Woolgrass

Scirpus cyperinus (L.) Kunth



Description

Leaf River Source is a clump-forming perennial with short rhizomes. The grass-like basal leaves are up to 4.5 feet in length and arch outwards from the base of the plant like a fountain. The flowering stems are 4-6 feet tall, leafy and somewhat coarse. The dense inflorescence contains numerous pale green flowers that become brown and woolly as the seeds mature. The tiny seeds are light tan and have numerous long bristles attached to them. Flowering begins in June and seed matures by September.

Uses: It is recommended for use in constructed wetlands and home septic systems. It can also be used for soil stabilization around the edges of lakes and ponds. The plants can provide cover for wildlife and nesting sites for some bird species.

Site Adaptation: It is adapted to swampy or shallow water areas, so it will not tolerate long periods of flooding, particularly during the growing season. Best growth is in areas ranging from wet soil to water four inches deep. Well established plants have fairly good drought tolerance.

Establishment

Use planting pieces divided from mature clumps. Each planting piece should contain a healthy shoot, a small section of rhizome, and a mass of roots. The best planting pieces are obtained from fairly young plants, because older (more than two years) clumps have fewer shoots and are difficult to divide. Care should be taken when dividing this plant because leaves have a sharp edge that can easily cut skin.

The shoot can be clipped to aid planting, but the leaves must extend several inches above the waterline; a length of 8-12 inches will be acceptable for most planting sites. If a solid stand is required, plants should be planted no more than two feet apart, because they will not spread far from the initial planting point.

On sites where water levels can be manipulated, plants will quickly establish if the soil can be kept saturated with little standing water. Once the plants begin growth, water levels can be raised and a light application of complete fertilizer is recommended.

Establishment Continued

Alternative Establishment Method: Another establishment method is to use greenhouse grown seedlings. The seed will not shed out of the cluster and therefore it can be collected anytime September to November. The fruiting head should be cut from the plant and stored dry and cool until use. The seed is difficult to remove from surrounding flower parts without specialized equipment, so the most efficient method will be to cut the cluster into smaller pieces and sow them without further cleaning.

Seed will germinate with or without a cool, moist treatment, but three months of stratification may increase the uniformity of germination. To stratify, moisten the plant pieces thoroughly, place them in a plastic bag, and store them in the refrigerator.

The pieces should be sown on the surface of the growing medium and lightly covered. The medium should be kept constantly moist until the seedlings are about 1 inch tall, then allowed to dry somewhat between watering.

A large number of seedlings will grow from the planting pieces, so leaves should be present. The seedlings can be planted on the site when 4-6 inches tall.

Management

Leaf River Source requires very little maintenance. Continuous fertilization is not recommended unless the growing site is extremely infertile. Some leaves generally remain green throughout the winter; however, the dead seed stalks are somewhat unsightly and may be cut if desired. Weed growth may become a problem in older stands.

Section 3: Production Practice Guidelines



The MSPMC began implementing no-till and crop rotation practices on production fields in 2003 with the goals of achieving higher yields, reducing weed pressure and building organic matter into our soils. Additional benefits from these practices would include reducing erosion, improving time efficiency, and lowering input costs. The methodology outlined in this case study explains the process currently in place at the MSPMC.

In the spring of 2003, we started no-tilling the majority of our production fields. This was the first step in our plan. Herbicide-resistant crops were introduced on open fields for maintenance and rotation. Herbicide-resistant soybeans and corn, as well as grain sorghum and wheat will be used in rotation with our production crops. Crop rotation and no-till will also be used outside of our regular crop production to help maintain weed-free and fertile fields for studies and increases soon to come.

For the first three years, a rotation of two years with maintenance crops and one year of production will be used. Examples of this can be seen in Table 1. Grain sorghum will be used for building organic matter where weed pressure is not as high. The herbicide resistant crops will be used on high weed pressure fields. The variation in crops will allow different combinations of herbicide chemistry to be used, therefore reducing the bank of weed seeds in those fields. Corn and grain sorghum will increase organic matter.

In the very beginning of our plan, it is evident that more acreage will be needed to include all production crops, rotation crops, and fields for upcoming studies and increases. Weather, soil types, weed types, grade, and location will dictate what crops go where in the beginning. As with farming, there is no exact script we can follow, only these guidelines to go by. New fields or old fields brought back into production are generally high in organic matter and weed pressure is intense. Therefore most of these fields should be planted to herbicide resistant soybeans if possible. The oldest fields will need to be planted in herbicide resistant corn or grain sorghum to build organic matter while still suppressing weeds. Production crops will fall in between or behind these crops.

Soil fertility will increase as soil testing is completed in front of on coming crops and behind past crops. Soil ph will be addressed immediately. With the building of our soils and fertility levels high, maximum yields and herbicide efficiency will be achieved. Unless economic data is needed in a study or the experiment consists of fertilizer rates, our philosophy should be “building the soil” instead of “fertilizing the crop”. In other words, regardless of the type of crop being planted, nutrient deficiencies will be addressed if at all possible.

Tillage will be greatly reduced. Complete no-till practices are good, but not always reachable. Some instances would be deep tillage for hard pan break up and smoothing tillage behind fields being rutted. Some bedding tillage may sometimes be needed. Long-range advantages of our no-till practices will be reduced hard pans and better drainage. All tillage practices should be done in the fall if possible. Stale seedbed plantings will take place in the spring behind field preparation in the fall. Our goal is to control weeds by dealing with the weed seed found in the top 2-3 inches of the soil. Control will be greatly reduced by trying to target the vast amounts of weed seed found throughout the soil profile. Minimal tillage results in less seed brought to the soil surface to germinate.

Cover crops will be used for different reasons. The advantages are less erosion, increased organic matter, and some weed suppression. Burndown herbicides will be used in late winter to early spring on these cover crops as well as non-covered fields. With conservation in mind, a variety of cover crops could be used. Soil type and grade, plus wildlife will help decide what covers to use where.

Wildflower production may need a separate set of guidelines, such as a three year production to two-year maintenance crop rotation. No-till practices would still be in place. Example of rotation in Table 3.

Perennial crops will be planted to fields known to be free of weed seed to give the plants a tremendous head start. Field preparation for such crops could consist of up to three years. Fallowing and herbicide resistant crops will be used in preparing for the perennials. Any bedding or special row configuration needed for such crops should be done ahead of maintenance crops so soil would not be disturbed ahead of desired perennial crop. Soil type and characteristics of the perennial being planted will decide for us where it is planted. Available weed seed and need of increase will decide when it is planted.

Table 1
 EXAMPLES OF THREE YEAR CROP ROTATIONS:
 2003-2005

- example 1: 1st year---Lark Selection Partridge Peas
 2nd year---Round-up Ready Corn
 3rd year---Round-up Ready Soybeans
- example 2: 1st year---Round-up Ready Soybeans
 2nd year---Grain Sorghum
 3rd year---Quail Haven Reseeding Soybean
- example 3: 1st year---Grain Sorghum
 2nd year--- Hopefield Trailing Wildbean
 3rd year---Round-up Ready Soybeans
- example 4: 1st year---Round-up Ready Corn
 2nd year---Round-up Ready Soybeans
 3rd year---Beaked Panicum Increase
- example 5: 1st year---Chiwapa Japanese Millet
 2nd year---Liberty Link Corn
 3rd year---Round-up Ready Soybeans

Note: For 2003-2005 a ratio of 2:1 for maintenance crops to production crops will be in place to bring weed control rapidly. In 2006, the ratio will change to a 1:1 or 2:2 ratio and production could double.

Table 2
 EXAMPLES OF CROP ROTATIONS IN A 1:1 OR 2:2 RATIO
 THAT WILL BE USED IN 2006 AFTER INITIAL GOALS
 OF FIRST THREE YEAR ROTATION ARE MET:

Example 1: 1st year---RR Soybeans
 2nd year---Chiwapa Japanese Millet
 3rd year--- Grain Sorghum
 4th year---Quail Haven Reseeding Soybean

Example 2: 1st year---Lark Selection Partridge Peas
 2nd year---Grain Sorghum
 3rd year---Hopefield Trailing Wildbean
 4th year---RR Soybeans

Example 3: 1st year---Meechee Arrowleaf Clover
 2nd year---RR Soybeans
 3rd year---Conventional Soybeans
 4th year---Meechee Arrowleaf Clover

Note: With quality fields in place, production will rise with higher yield resulting from fertility, less weed pressure while growing, efficient seed cleaning with no weed seed, and more acreage. New selections for increase will come on at a faster rate with more available acreage, no weed competition, and very efficient seed cleaning that is needed with small amounts of seed dealt with in this scenario.

Table 3

EXAMPLES OF CROP ROTATION FOR WILDFLOWER SEED PRODUCTION
ON A 3 YEAR PRODUCTION TO A TWO YEAR MAINTENANCE CROP RATIO: 2003-2007

Example 1: 1st year---Black-eyed Susan Production
 2nd year---Black-eyed Susan Production
 3rd year---Black-eyed Susan Production
 4th year---RR Corn
 5th year---RR Soybeans

Example 2: 1st year---RR Soybeans
 2nd year---Clasping Coneflower Production
 3rd year---Clasping Coneflower Production
 4th year---Clasping Coneflower Production
 5th year---RR Corn

Example 3: 1st year---Grain Sorghum
 2nd year---RR Soybeans
 3rd year---Bidens Production
 4th year---Bidens Production
 5th year---Bidens Production

Note: Production could possibly go longer than 3 years without maintenance; especially in years to come.

Table 4

EXAMPLE OF CROP ROTATION AND FIELD PREPARATION FOR PERENNIAL CROPS
AND SELECTION INCREASES TO COME IN THE FUTURE:

Example 1: 1st year---Field Opened Up

2nd year---Grain Sorghum

3rd year---RR Soybeans

4th year---Available for perennial or increase

Example 2: 1st year---Lark Selection Partridge Peas

2nd year---RR Corn

3rd year---RR Soybeans

4th year---Available for perennial or increase

Example 3 1st year---Quail Haven Reseeding Soybean

2nd year---RR Corn

3rd year---Lark Selection Partridge Pea

4th year---RR Soybeans

5th year---RR Soybeans

6th year---Available for increase or perennial

Section 4: Combine Settings for Seed Harvest at Jamie L. Whitten PMC (John Deere Model 9410)



CROP HARVESTED	FAN RPMS	CYLINDER SPEED	CONCAVE SETTING	CHAFFER	EXTENSION	SIEVE	PRE-CLEANER
Meechee Clover	700-850	650-800	0-10	10	10	5	0
Quail Haven Soybeans	950-1100	400-500	25-30	14	12	10	0
Chiwapa Millet	750-800	650-750	10 thru 15	12	12	5	0
Lark Selection Partridge Pea	800-900	300-500	0-15	14	12	6	0
Highlander Gamagrass	900-1050	480-520	16-12	16	14	12	3turns
Hopefield Trailing Beans	1000	400-500	24-30	16	12	12	0
Clasping Coneflower	low	300-500	0-15	10	10	4	0
Black-eyed Susan	low	300-500	0-15	10	10	4	0
Switchgrass	650-750	650-750	10 thru 16	12	12	5	0

Section 5:

Estimated Seed Production Cost Budgets for Jamie L. Whitten PMC Releases



Estimated production cost budgets can be good tools when looking for possible growers for PMC releases. The first question a seed grower is going to want to know is “how much an acre does it cost to raise _____ seed crop”. This information is vital when one is deciding on venturing into seed production of a new release.

In the future it is hopeful that we can produce a cost budget for each one of the PMC releases. It can be as detailed as one would like, but a simple chart such as the one used in the Native Grass Seed Production Manual would give a person the basic information of what one could expect expense wise in growing such release. A more detailed cost budget like the ones used for row crops by extension services could also be helpful in creating a guide for each release. Perennial crops would have expenses lined out for the establishment year as well as years following. Annual crops would be similar to other row crop cost budgets. The information could be used for possible new seed growers when making decisions about growing a PMC release. An added column that could be left blank for his/her own production factors could be included alongside PMC estimated input cost. Two budgets for each release would be necessary; one where conventional tillage is used and another for no-till. Sometimes perennial crops would need a fall and spring planting budget if both planting dates are possible. These budgets could be updated every two years as input cost change over time.

Acknowledgements:

Cost data was compiled by Jon Allison, Gardener, Coffeeville, PMC. Material has been reviewed by: Paul B. Rodrigue, Manager, PMC, Coffeeville, MS; Livia Marques, PMS, ENTSC; Joel Douglas, PMS, CNTSC, Ft. Worth, TX; Janet Grabowski, Manager, PMC Brooksville, Fl; Marion Reed, Economist, ECS, Jackson, MS.

Recommended Citation:

USDA-NRCS Jamie L. Whitten Plant Materials Center. Plant Materials Technical Note No. 101. Estimated Seed Production Cost Budgets for Coffeeville PMC Releases. USDANRCS Jamie L. Whitten Plant Materials Center, Coffeeville, MS, April, 2006. 18p.

Table of Contents

- I. ‘Chiwapa’ Millet, conventional till
- II. ‘Chiwapa’ Millet, no-till
- III. ‘Highlander’ Gamagrass, stale seedbed, Establishment Year
- IV. ‘Highlander’ Gamagrass, stale seedbed, Year Two and Following
- V. Lark Selection Partridge Pea, conventional till
- VI. Lark Selection Partridge Pea, no-till
- VII. Lark Selection Partridge Pea, stale seedbed
- VIII. ‘Meechee’ Arrowleaf Clover, conventional till, establishment year
- IX. ‘Meechee’ Arrowleaf Clover, conventional till, Year Two and following
estimated production cost
- X. ‘Meechee’ Arrowleaf Clover, no-till, establishment year
- XI. ‘Meechee’ Arrowleaf Clover, no-till , Year Two and Following
- XII. ‘Quail Haven’ Reseeding Soybean, conventional till w/corn
- XIII. ‘Quail Haven’ Reseeding Soybean, no-till
- XIV. ‘Quail Haven’ Reseeding Soybean, stale seedbed till w/corn

I. 'Chiwapa' Millet, conventional till

Estimated Production Cost for 'Chiwapa' Millet (conventional tilled) 2005

**Jamie L. Whitten Plant Materials Center
Coffeeville, Mississippi**

Item or task	Cost / Acre	Your Farm
Foundation Seed (16 lbs/acre)	\$24	_____
Seedbed Preparation (disk 2X, harrow, roll)	\$80	_____
Drill Millet	\$20	_____
Apply Herbicides (2 applications)	\$20	_____
Apply Fertilizer w/tractor-spreader (2 applications)	\$10	_____
Harvest (Combine w/ 20 ft header)	\$25	_____
Fertilizer (8-24-24 @ 200 lbs/acre)	\$34	_____
Fertilizer (34-0-0 @ 150 lbs/acre)	\$24	_____
Post-emerge Herbicide (broadleaves) + surfactant	\$4	_____
Post-emerge Herbicide (broadleaves) + surfactant	\$8	_____

Total Estimated Production Cost = \$249

Expected Income / Your Farm

1. Expected seed yield _____ lb/acre
2. Expected price per lb _____
3. Gross return minus production cost _____

II. 'Chiwapa' Millet, no-till

Estimated Production Cost for 'Chiwapa' Millet (no -till) 2005

**Jamie L. Whitten Plant Materials Center
Coffeerville, Mississippi**

Item or task	Cost / Acre	Your Farm
Foundation Seed (16 lbs/acre)	\$24	_____
Drill Millet	\$20	_____
Apply Herbicides (4 applications)	\$40	_____
Apply Fertilizer w/tractor/spreader (2 applications)	\$20	_____
Harvest (Combine w/20 ft header)	\$25	_____
Fertilizer (8-24-24 @ 200 lbs/acre)	\$34	_____
Fertilizer (34-0-0 @ 150 lbs/acre)	\$24	_____
Burndown Herbicides	\$9	_____
Burndown Herbicide	\$10	_____
Post-emerge Herbicide (broadleaves) + surfactant	\$4	_____
Post-emerge Herbicide (broadleaves) + surfactant	\$8	_____

Total Estimated Production Cost = \$218

Expected Income / Your Farm

1. Expected seed yield _____ lb/acre
2. Expected price per lb _____
3. Gross return minus production cost _____

III. 'Highlander' Gamagrass, stale seedbed, Establishment Year

Estimated Production Cost for 'Highlander' Gamagrass Seed Production (stale seedbed) 2005

**Jamie L. Whitten Plant Materials Center
Coffeeville, Mississippi**

Item or task	Cost / Acre	Your Farm
Foundation Seed (16 lbs/acre)	\$192	_____
Seedbed Preparation (disk 2X, bed, roll)	\$80	_____
Plant Cover Crop w/tractor-spreader	\$8	_____
Plant Highlander Gamagrass	\$20	_____
Apply Herbicides (5 applications)	\$50	_____
Apply Fertilizer w/tractor-spreader (2 applications)	\$10	_____
Apply Lime (1 application @ \$25/ton)	\$25	_____
Fertilizer (8-24-24 @ 300lbs/acre)	\$51	_____
Fertilizer (34-0-0 @ 150lbs/acre)	\$24	_____
Burndown Herbicides (2 applications)	\$18	_____
Pre-emerge Herbicides	\$8	_____
Early Post-emerge Herbicide	\$4	_____
Post-emerge Herbicide (broadleaves)	\$8	_____
Hand roguing (2 hours/acre)	\$20	_____
Cover Crop Seed (wheat)	\$11	_____

Total Estimated Production Cost = \$529

Expected Income / Your Farm

1. Expected seed yield _____ lb/acre
2. Expected price per lb _____
3. Gross return minus production cost _____

***Note: there is no expected seed yield during the first year of establishment.**

IV. 'Highlander' Gamagrass, stale seedbed, Year Two and Following Estimated Production Cost

Year Two and Following Estimated Production Cost

Jamie L. Whitten Plant Materials Center

Coffeeville, Mississippi

Item or task	Cost / Acre	Your Farm
Burn Fields (2 hours/acre)	\$20	_____
Apply Herbicides (4 applications)	\$40	_____
Apply Insecticide (1 application)	\$10	_____
Apply Fertilizer w/tractor-spreader (3 applications)	\$15	_____
Fertilizer (0-20-20 @ 300 lbs/acre)	\$42	_____
Fertilizer (34-0-0 @ 150 lbs/acre >spring)	\$24	_____
Fertilizer (34-0-0 @ 150 lbs/acre >post-harvest)	\$24	_____
Soil Applied Residual Herbicides	\$8	_____
Early Post-emerge Herbicide (grass)	\$20	_____
Post-emerge Herbicide (broadleaves)	\$8	_____
Post-emerge Herbicide (spot-spraying)	\$2	_____
Harvest (Combine w/ 20ft header)	\$25	_____
Hand Roguing (2 hours/acre)	\$20	_____
Insecticide	\$5	_____

**Total Estimated Yearly Production Cost
for Highlander Seed Production**

\$263

Expected Income / Your Farm

1. Expected cost of establishment per acre = _____
2. Expected production cost per acre in years following establishment = _____
3. Expected seed yield / acre in year two of production = _____
4. Expected seed yield / acre each year following = _____
5. Expected price per lb = _____
6. Gross return minus production cost _____

***Note: seed yield per acre will be small in year two compared to following years.**

V. Lark Selection Partridge Pea, conventional till

Estimated Production Cost for Lark Selection Partridge Pea (conventional tilled) 2005

**Jamie L. Whitten Plant Materials Center
Coffeerville, Mississippi**

Item or task	Cost / Acre	Your Farm
Foundation Seed (8 lbs PLS / acre)	\$100	_____
Seedbed Preparation (disk, harrow, bed)	\$75	_____
Plant	\$20	_____
Apply Herbicides (3 applications)	\$30	_____
Apply Fertilizer w/tractor-spreader	\$5	_____
Cultivate (2 trips)	\$25	_____
Harvest (Combine w/ 20ft header)	\$25	_____
Fertilizer (0-20-20 @ 300 lbs/acre)	\$42	_____
Pre-emerge Herbicide (grass)	\$12	_____
Post-emerge Herbicide (grass) + crop oil	\$13	_____
Post-emerge Herbicide (broadleaves) + surfactant	\$12	_____
Hand Roguing (2 hours/acre)	\$20	_____

Total Estimated Production Cost = \$379

Expected Income / Your Farm

- 1. Expected seed yield** _____ **lb/acre**
- 2. Expected price per lb** _____
- 3. Gross return minus production cost** _____

VI. Lark Selection Partridge Pea, no-till

Estimated Production Cost for Lark Selection Partridge Pea (no-till) 2005

**Jamie L. Whitten Plant Materials Center
Coffeerville, Mississippi**

Item or task	Cost / Acre	Your Farm
Foundation Seed (8 lbs PLS / acre)	\$100	_____
Plant Partridge Peas	\$20	_____
Apply Herbicides (4 applications)	\$40	_____
Apply Fertilizer w/tractor-spreader	\$5	_____
Harvest (Combine w/ 20ft header)	\$25	_____
Fertilizer (0-20-20 @ 300 lbs/acre)	\$42	_____
Burndown Herbicides	\$9	_____
Pre-emerge Herbicide (grass)	\$12	_____
Post-emerge Herbicide (grass) + crop oil	\$13	_____
Post-emerge Herbicide (broadleaves) + surfactant	\$12	_____
Hand Roguing (2 hours/acre)	\$20	_____

Total Estimated Production Cost = \$298

Expected Income / Your Farm

1. Expected seed yield _____ lb/acre
2. Expected price per lb _____
3. Gross return minus production cost _____

VII. Lark Selection Partridge Pea, stale seedbed

Estimated Production Cost for Lark Selection Partridge Pea (stale seedbed) 2005

**Jamie L. Whitten Plant Materials Center
Coffeetown, Mississippi**

Item or task	Cost / Acre	Your Farm
Foundation Seed (8 lbs PLS / acre)	\$100	_____
Seedbed Preparation (disk, harrow, bed)	\$75	_____
Plant Cover Crop w/tractor-spreader	\$8	_____
Plant Partridge Pea	\$20	_____
Cover Crop Seed (wheat)	\$11	_____
Apply Herbicides (4 applications)	\$40	_____
Apply Fertilizer w/tractor-spreader	\$5	_____
Harvest (Combine w/ 20ft header)	\$25	_____
Fertilizer (0-20-20 @ 300 lbs/acre)	\$42	_____
Burndown Herbicides	\$9	_____
Pre-emerge Herbicide (grass)	\$12	_____
Post-emerge Herbicide (grass) + crop oil	\$13	_____
Post-emerge herbicide (broadleaves) + surfactant	\$12	_____
Hand Roguing	\$20	_____

Total Estimated Production Cost = \$334

Expected Income / Your Farm

1. Expected seed yield _____ lb/acre
2. Expected price per lb _____
3. Gross return minus production cost _____

VIII. 'Meechee' Arrowleaf Clover, conventional till, establishment year

Estimated Production Cost for 'Meechee' Arrowleaf Clover (conventional till) 2005

Jamie L. Whitten Plant Materials Center

Coffeeville, Mississippi

Item or task	Cost / Acre	Your Farm
Foundation Seed (10 lbs/acre)	\$15	_____
Seedbed Preparation (disk 2X, harrow, roll 2X)	\$90	_____
Drill Meechee Seed	\$25	_____
Apply Herbicides (2 applications)	\$20	_____
Apply Fertilizer w/tractor-spreader (1 application)	\$5	_____
Apply Lime (1 application @ \$25/ton)	\$25	_____
Fertilizer (0-20-20 @ 300 lbs/acre)	\$42	_____
Pre-emerge Herbicide (grass)	\$4	_____
Post-emerge Herbicide (grass) + crop oil	\$13	_____
Hand Roguing (2 hours/acre)	\$20	_____
Harvest (Combine w/ 20ft header)	\$25	_____
Maintenance Clipping (tractor w/bush hog 2X)	\$50	_____

Total Estimated Production Cost = \$334

Expected Income / Your Farm

- 1. Expected seed yield** _____ **lb/acre**
- 2. Expected price per lb** _____
- 3. Gross return minus production cost** _____

IX. ‘Meechee’ Arrowleaf Clover, conventional till, Year Two and following estimated production cost

‘Meechee’ Arrowleaf Clover, conventional till, Year Two and Following Estimated Production Cost

**Jamie L. Whitten Plant Materials Center
Coffeeville, Mississippi**

Item or task	Cost / Acre	Your Farm
Apply Herbicides (4 applications)	\$40	_____
Apply Fertilizer w/tractor-spreader (1 application)	\$5	_____
Fertilizer (0-20-20 @ 300 lbs/acre)	\$42	_____
Soil Applied Residual Herbicide (grass)	\$4	_____
Post-emerge Herbicide (grass)	\$13	_____
Post-emerge Herbicide (broadleaves)	\$18	_____
Post-emerge Herbicide (spot spraying)	\$2	_____
Hand Roguing (2 hours/acre)	\$20	_____
Harvest (Combine w/ 20ft header)	\$25	_____
Maintenance Clipping (tractor w/bush hog 2X)	\$50	_____

Total Estimated Production Cost = \$219

Expected Income / Your Farm

- 1. Expected cost/acre for establishment year** _____
- 2. Expected production cost per acre in following years** _____
- 3. Expected seed yield/acre** _____
- 4. Expected price per lb** _____
- 5. Expected return above production cost** _____

X. 'Meechee' Arrowleaf Clover, no-till, establishment year

Estimated Production Cost for 'Meechee' Arrowleaf Clover (no-till) 2005

**Jamie L. Whitten Plant Materials Center
Coffeeville, Mississippi**

Item or task	Cost / Acre	Your Farm
Foundation Seed (10 lbs/acre)	\$15	_____
Drill Meechee Seed	\$25	_____
Apply Herbicides (4 applications)	\$40	_____
Apply Fertilizer w/tractor-spreader (1 application)	\$5	_____
Apply Lime (1 application @ \$25/ton)	\$25	_____
Fertilizer (0-20-20 @ 300 lbs/acre)	\$42	_____
Burndown Herbicide	\$9	_____
Burndown Herbicide	\$9	_____
Pre-emerge Herbicide (grass)	\$4	_____
Post-emerge Herbicide (grass) + crop oil	\$13	_____
Hand Roguing (2 hours/acre)	\$20	_____
Harvest (Combine w/ 20ft header)	\$25	_____
Maintenance Clipping (tractor w/bush hog 2X)	\$50	_____

Total Estimated Production Cost = \$282

Expected Income / Your Farm

- 1. Expected seed yield** _____ **lb/acre**
- 2. Expected price per lb** _____
- 3. Gross return minus production cost** _____

XI. ‘Meechee’ Arrowleaf Clover, no-till, Year Two and Following Estimated Production Cost

‘Meechee’ Arrowleaf Clover, no-till, Year Two and Following Estimated Production Cost

Jamie L. Whitten Plant Materials Center

Coffeeville, Mississippi

Item or task	Cost / Acre	Your Farm
Apply Herbicides (4 applications)	\$40	_____
Apply Fertilizer w/tractor-spreader (1 application)	\$5	_____
Fertilizer (0-20-20 @ 300 lbs/acre)	\$42	_____
Soil Applied Residual Herbicide (grass)	\$4	_____
Post-emerge herbicide (grass)	\$13	_____
Post-emerge Herbicide (broadleaves)	\$18	_____
Post-emerge Herbicide (spot spraying)	\$2	_____
Hand Roguing (2 hours/acre)	\$20	_____
Harvest (Combine w/ 20ft header)	\$25	_____
Maintenance Clipping (tractor w/bush hog 2X)	\$50	_____

Total Estimated Production Cost = \$219

Expected Income / Your Farm

- 1. Expected cost/acre for establishment year** _____
- 2. Expected production cost per acre in following years** _____
- 3. Expected seed yield/acre** _____
- 4. Expected price per lb** _____
- 5. Expected return above production cost** _____

XII. 'Quail Haven' Reseeding Soybean, conventional till w/corn

Estimated Production Cost for 'Quail Haven' Reseeding Soybeans (conventional till with corn) 2005

Jamie L. Whitten Plant Materials Center

Coffeeville, Mississippi

Item or task	Cost / Acre	Your Farm
Foundation Seed (20 lbs/acre)	\$30	_____
Corn Seed (10 lbs/acre)	\$20	_____
Seedbed Preparation (disk 2X, harrow)	\$75	_____
Plant	\$20	_____
Apply Herbicides (3 applications)	\$30	_____
Apply Fertilizer w/tractor-spreader	\$5	_____
Cultivate (1 pass)	\$12	_____
Harvest (Combine w/ 20ft header)	\$25	_____
Fertilizer (0-20-20 @ 300 lbs/acre)	\$42	_____
Pre-emerge herbicides (grass + broadleaves)	\$22	_____
Post-emerge herbicide (broadleaves) + surfactant	\$18	_____
Post-emerge herbicide (broadleaves) + surfactant	\$18	_____
Hand Roguing (2 hours/acre)	\$20	_____

Total Estimated Production Cost = \$337

Expected Income / Your Farm

- 1. Expected seed yield** _____ **lb/acre**
- 2. Expected price per lb** _____
- 3. Gross return minus production cost** _____

XIII. 'Quail Haven' Reseeding Soybean, no-till

Estimated Production Cost for 'Quail Haven' Reseeding Soybeans (no-till) 2005

Jamie L. Whitten Plant Materials Center

Coffeeville, Mississippi

Item or task	Cost / Acre	Your Farm
Foundation Seed (20 lbs/acre)	\$30	_____
Plant	\$25	_____
Apply Herbicides (4 applications)	\$40	_____
Apply Fertilizer w/tractor-spreader	\$5	_____
Harvest (Combine w/ 20ft header)	\$25	_____
Fertilizer (0-20-20 @ 300 lbs/acre)	\$42	_____
Burndown Herbicides	\$9	_____
Pre-emerge Herbicides (grass + broadleaves)	\$25	_____
Post-emerge Herbicide (grass) + crop oil	\$13	_____
Post -emerge Herbicide (broadleaves) + surfactant	\$12	_____
Hand Roguing (2 hours/acre)	\$20	_____

Total Estimated Production Cost = \$246

Expected Income / Your Farm

- 1. Expected seed yield** _____ **lb/acre**
- 2. Expected price per lb** _____
- 3. Gross return minus production cost** _____

XIV. 'Quail Haven' Reseeding Soybean, stale seedbed till w/corn

Estimated Production Cost for 'Quail Haven' Reseeding Soybeans (stale seedbed with corn) 2005

Jamie L. Whitten Plant Materials Center

Coffeeville, Mississippi

Item or task	Cost / Acre	Your Farm
Foundation Seed (20 lbs/acre)	\$30	_____
Corn Seed (10 lbs/acre)	\$20	_____
Seedbed Preparation (disk 2X, harrow)	\$75	_____
Plant	\$20	_____
Plant Cover Crop w/tractor-spreader	\$8	_____
Cover Crop Seed (wheat)	\$11	_____
Apply Herbicides (4 applications)	\$40	_____
Apply Fertilizer w/tractor-spreader	\$5	_____
Harvest (Combine w/ 20ft header)	\$25	_____
Fertilizer (0-20-20 @ 300lbs/acre)	\$42	_____
Burndown Herbicides	\$9	_____
Pre-emerge Herbicides (grass + broadleaves)	\$22	_____
Post-emerge Herbicides (broadleaves) + surfactant	\$18	_____
Post-emerge Herbicides (broadleaves) + surfactant	\$18	_____
Hand Roguing (2 hours/acre)	\$20	_____

Total Estimated Production Cost = \$363

Expected Income / Your Farm

- 1. Expected seed yield** _____ **lb/acre**
- 2. Expected price per lb** _____
- 3. Gross return minus production cost** _____

Cooperators

While performing our plant development work, cooperation is needed at all levels to make progress with our mission goals.

The following is a partial list of cooperators who have participated in the plant materials program.

- Mississippi Soil and Water Conservation Commission
- Mississippi Seed Improvement Association
- Mississippi State University
- Soil and Water Conservation Districts
- Mississippi Cooperative Extension Service
- USDA Forest Service

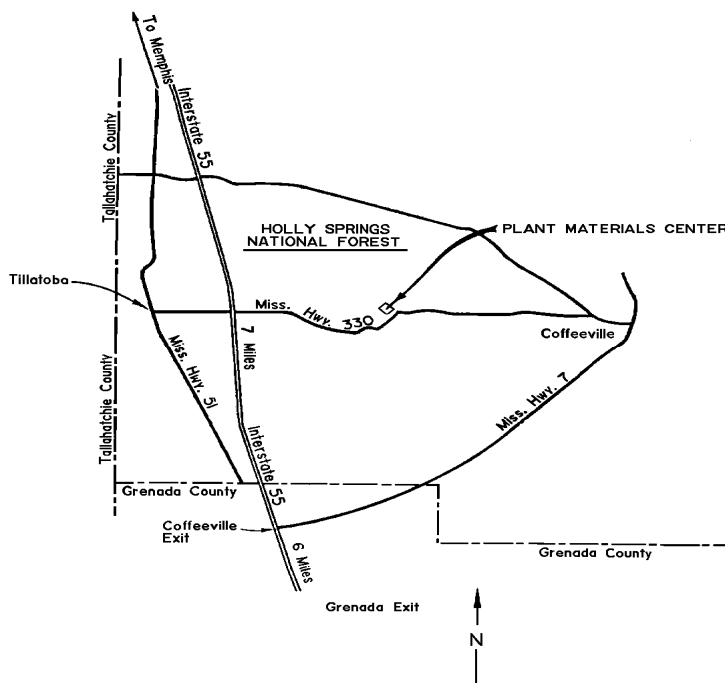


Contact Information



Visitors are welcome. The center is open Monday-Friday from 8:00 am to 4:30 pm. Please call in advance for group tours.

Jamie L. Whitten Plant Materials Center
2533 County Rd. 65
Coffeeville, MS 38922
Phone: (662) 675-2588
Fax: (662) 675-2369



The PMC is located half-way between Jackson, MS & Memphis, TN. From I-55- take exit 220 to Hwy 330, go east 5 miles, and then turn left on gravel road. From Hwy 7-turn right on Hwy 330, go about a half mile, follow sign and go west about 5 miles. Turn right on gravel road.



Visit the Plant Materials Program website to find more information on solving conservation problems using plants.

<http://Plant-Materials.nrcs.usda.gov>

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotope, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.